



## SEQUENCE LISTING

<110> Chen, Hongyun  
Le Bihan, Stephane

<120> NOVEL ABCG4 TRANSPORTER AND USES THEREOF

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<140> US 10/090,455

<141> 2002-03-01

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 Cys His Phe Gln Lys Ser Glu Ala Ile Leu Arg Glu Leu Asp Val Glu  
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 Lys Ser Gly Phe Leu Pro Cys Arg Lys Pro Val Glu Lys Glu Ile Leu  
 50 55 60  
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 65 70 75 80  
 Pro Thr Gly Gly Gly Lys Ser Ser Leu Leu Asp Val Leu Ala Ala Arg

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Lys	Asn	Asp	Ser	Thr	Gly	Ile	Gln	Asn	Arg	Ala	Gly	Val	Leu	Phe	Phe
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Phe	Val	Phe	Met	Met	Ile	Phe	Ser	Gly	Leu	Leu	Val	Asn	Leu	Thr	Thr			
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Ile	Ala	Ser	Trp	Leu	Ser	Trp	Leu	Gln	Tyr	Phe	Ser	Ile	Pro	Arg	Tyr			
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Gly	Phe	Thr	Ala	Leu	Gln	His	Asn	Glu	Phe	Leu	Gly	Gln	Asn	Phe	Cys			
			580					585				590						
Pro	Gly	Leu	Asn	Ala	Thr	Gly	Asn	Asn	Pro	Cys	Asn	Tyr	Ala	Thr	Cys			
		595				600					605							
Thr	Gly	Glu	Glu	Tyr	Leu	Val	Lys	Gln	Gly	Ile	Asp	Leu	Ser	Pro	Trp			
	610				615						620							
Gly	Leu	Trp	Lys	Asn	His	Val	Ala	Leu	Ala	Cys	Met	Ile	Val	Ile	Phe			
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<212> PRT
<213> Homo sapiens
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Pro	Glu	Pro 35	His	Ser	Leu	Gly 40	Ile	Leu	His	Ala	Ser	Tyr 45	Ser	Val	Ser
His	Arg 50	Val	Arg	Pro	Trp 55	Trp	Asp	Ile	Thr	Ser	Cys 60	Arg	Gln	Gln	Trp
Thr 65	Arg	Gln	Ile	Leu	Lys 70	Asp	Val	Ser	Leu	Tyr 75	Val	Glu	Ser	Gly 80	Gln
Ile	Met	Cys	Ile 85	Leu	Gly	Ser	Ser	Gly 90	Ser	Gly	Lys	Thr	Thr 95	Leu	Leu
Asp	Ala	Met 100	Ser	Gly	Arg	Leu	Gly	Arg 105	Ala	Gly	Thr	Phe	Leu 110	Gly	Glu
Val	Tyr	Val 115	Asn	Gly	Arg	Ala	Leu	Arg 120	Arg	Glu	Gln	Phe	Gln 125	Asp	Cys
Phe	Ser 130	Tyr	Val	Leu	Gln	Ser	Asp 135	Thr	Leu	Leu	Ser	Ser	Leu 140	Thr	Val
Arg 145	Glu	Thr	Leu	His	Tyr 150	Thr	Ala	Leu	Leu	Ala 155	Ile	Arg	Arg	Gly 160	Asn
Pro	Gly	Ser	Phe 165	Gln	Lys	Lys	Val	Glu	Ala 170	Val	Met	Ala	Glu	Leu 175	Ser
Leu	Ser	His 180	Val	Ala	Asp	Arg	Leu	Ile 185	Gly	Asn	Tyr	Ser	Leu 190	Gly	Gly
Ile	Ser 195	Thr	Gly	Glu	Arg	Arg	Arg 200	Val	Ser	Ile	Ala	Ala 205	Gln	Leu	Leu
Gln	Asp 210	Pro	Lys	Val	Met	Leu	Phe 215	Asp	Glu	Pro	Thr 220	Thr	Gly	Leu	Asp
Cys	Met	Thr	Ala	Asn	Gln	Ile	Val	Val	Leu	Leu	Val	Glu	Leu	Ala	Arg



225					230					235					240
Arg	Asn	Arg	Ile	Val	Val	Leu	Thr	Ile	His	Gln	Pro	Arg	Ser	Glu	Leu
				245					250					255	
Phe	Gln	Leu	Phe	Asp	Lys	Ile	Ala	Ile	Leu	Ser	Phe	Gly	Glu	Leu	Ile
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Phe	Cys	Gly	Thr	Pro	Ala	Glu	Met	Leu	Asp	Phe	Phe	Asn	Asp	Cys	Gly
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Tyr	Pro	Cys	Pro	Glu	His	Ser	Asn	Pro	Phe	Asp	Phe	Tyr	Met	Asp	Leu
	290					295				300					
Thr	Ser	Val	Asp	Thr	Gln	Ser	Lys	Glu	Arg	Glu	Ile	Glu	Thr	Ser	Lys
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Arg	Val	Gln	Met	Ile	Glu	Ser	Ala	Tyr	Lys	Lys	Ser	Ala	Ile	Cys	His
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Lys	Thr	Leu	Lys	Asn	Ile	Glu	Arg	Met	Lys	His	Leu	Lys	Thr	Leu	Pro
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Leu	Phe	Phe	Val	Leu	Arg	Val	Arg	Ser	Asn	Val	Leu	Lys	Gly	Ala	Ile
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Ile	Ile	Ser	Tyr	Phe	Thr	Phe	Gln	Lys	Tyr	Cys	Ser	Glu	Ile	Leu	Val
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Val	Asn	Glu	Phe	Tyr	Gly	Leu	Asn	Phe	Thr	Cys	Gly	Ser	Ser	Asn	Val
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 <212> PRT  
 <213> Homo sapiens

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Val	Arg	Asp	Leu	Asn	Tyr	Gln	Val	Asp	Leu	Ala	Ser	Gln	Val	Pro	Trp
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Ser	Gly	Gln	Met	Leu	Ala	Ile	Ile	Gly	Ser	Ser	Gly	Cys	Gly	Arg	Ala
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Ser	Leu	Leu	Asp	Val	Ile	Thr	Gly	Arg	Gly	His	Gly	Gly	Lys	Ile	Lys
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Ser	Gly	Gln	Ile	Trp	Ile	Asn	Gly	Gln	Pro	Ser	Ser	Pro	Gln	Leu	Val
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Leu	Thr	Val	Arg	Glu	Thr	Leu	Ala	Phe	Ile	Ala	Gln	Met	Arg	Leu	Pro
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Ser	Gly	Leu	Asp	Ser	Phe	Thr	Ala	His	Asn	Leu	Val	Lys	Thr	Leu	Ser
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Arg	Leu	Ala	Lys	Gly	Asn	Arg	Leu	Val	Leu	Ile	Ser	Leu	His	Gln	Pro
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Cys Leu Pro Ser Pro Thr Lys Met Pro Gly Ala Val Gln Gln Phe Thr
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      405              410              415
Leu Leu Ile His Gly Ala Glu Ala Cys Leu Met Ser Met Thr Ile Gly
      420              425              430
Phe Leu Tyr Phe Gly His Gly Ser Ile Gln Leu Ser Phe Met Asp Thr
      435              440              445
Ala Ala Leu Leu Phe Met Ile Gly Ala Leu Ile Pro Phe Asn Val Ile
      450              455              460
Leu Asp Val Ile Ser Lys Cys Tyr Ser Glu Arg Ala Met Leu Tyr Tyr
465              470              475              480
Glu Leu Glu Asp Gly Leu Tyr Thr Thr Gly Pro Tyr Phe Phe Ala Lys
      485              490              495
Ile Leu Gly Glu Leu Pro Glu His Cys Ala Tyr Ile Ile Ile Tyr Gly
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Met Pro Thr Tyr Trp Leu Ala Asn Leu Arg Pro Gly Leu Gln Pro Phe
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Leu Leu His Phe Leu Leu Val Trp Leu Val Val Phe Cys Cys Arg Ile
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Phe Phe Ser Asn Ala Leu Tyr Asn Ser Phe Tyr Leu Ala Gly Gly Phe
      565              570              575
Met Ile Asn Leu Ser Ser Leu Trp Thr Val Pro Ala Trp Ile Ser Lys
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Val Ser Phe Leu Arg Trp Cys Phe Glu Gly Leu Met Lys Ile Gln Phe
      595              600              605
Ser Arg Arg Thr Tyr Lys Met Pro Leu Gly Asn Leu Thr Ile Ala Val
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Ser Gly Asp Lys Ile Leu Ser Val Met Glu Leu Asp Ser Tyr Pro Leu
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Tyr Ala Ile Tyr Leu Ile Val Ile Gly Leu Ser Gly Gly Phe Met Val
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Trp

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<212> PRT
<213> Homo sapiens

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His Leu Pro Lys Arg Ser Ala Val Asp Ile Glu Phe Val Glu Leu Ser
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Tyr Ser Val Arg Glu Gly Pro Cys Trp Arg Lys Arg Gly Tyr Lys Thr

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Ile	Met	Gly	Pro	Ser	Gly	Ala	Gly	Lys	Ser	Thr	Phe	Met	Asn	Ile	Leu
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Ala	Gly	Tyr	Arg	Glu	Ser	Gly	Met	Lys	Gly	Gln	Ile	Leu	Val	Asn	Gly
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Arg	Pro	Arg	Glu	Leu	Arg	Thr	Phe	Arg	Lys	Met	Ser	Cys	Tyr	Ile	Met
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Gln	Asp	Asp	Met	Leu	Leu	Pro	His	Leu	Thr	Val	Leu	Glu	Ala	Met	Met
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Leu	Val	Thr	Glu	Ile	Leu	Thr	Ala	Leu	Gly	Leu	Met	Ser	Cys	Ser	His
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Thr	Arg	Thr	Ala	Leu	Leu	Ser	Gly	Gly	Gln	Arg	Lys	Arg	Leu	Ala	Ile
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Pro	Ser	Ala	Lys	Leu	Phe	Glu	Met	Phe	Asp	Lys	Leu	Tyr	Ile	Leu	Ser
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Gln	Gly	Gln	Cys	Ile	Phe	Lys	Gly	Val	Val	Thr	Asn	Leu	Ile	Pro	Tyr
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Phe	Ile	Ile	Glu	Val	Ala	Ser	Gly	Glu	Tyr	Gly	Asp	Leu	Asn	Pro	Met
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Ser	Ser	Pro	Glu	Lys	Asn	Glu	Val	Pro	Ala	Pro	Cys	Pro	Pro	Cys	Pro
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Pro	Glu	Val	Asp	Pro	Ile	Glu	Ser	His	Thr	Phe	Ala	Thr	Ser	Thr	Leu
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Asp	Thr	Val	Leu	Thr	His	Leu	Arg	Phe	Met	Ser	His	Val	Val	Ile	Gly
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Val	Phe	Asn	Asn	Thr	Gly	Cys	Leu	Phe	Phe	Ser	Met	Leu	Phe	Leu	Met
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Phe	Ala	Ala	Leu	Met	Pro	Thr	Val	Leu	Thr	Phe	Pro	Leu	Glu	Met	Ala
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Val	Phe	Met	Arg	Glu	His	Leu	Asn	Tyr	Trp	Tyr	Ser	Leu	Lys	Ala	Tyr
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Thr	Ser	Arg	Phe	Leu	Leu	Phe	Ser	Ala	Leu	Ala	Thr	Ala	Thr	Ala	Leu

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Gln	Val	Ala	Thr	Phe	Val	Gly	Pro	Val	Thr	Ala	Ile	Pro	Val	Leu	Leu		
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Phe	Ser	Gly	Phe	Phe	Val	Ser	Phe	Lys	Thr	Ile	Pro	Thr	Tyr	Leu	Gln		
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Trp	Ser	Ser	Tyr	Leu	Ser	Tyr	Val	Arg	Tyr	Gly	Phe	Glu	Gly	Val	Ile		
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gggccccact tacaactgac caaagtggcc cctctkggg gtccccacca cacaagtgtt 2400
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aagtcccatc atggatgttg aaatggacag ggaaggactc tggaaagtctc ttctcctcc 2520
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gggttttctg tctaggtcac cactcccaat cctgggggrt tggagrggcc tggggstgtg 2640
ggrtgsccca tccccctccc catcacctt ggtgggggsa ggcctg 2687
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<210> 13  
 <211> 646  
 <212> PRT  
 <213> Homo sapiens

&lt;220&gt;

&lt;221&gt; VARIANT

&lt;222&gt; 579, 598

&lt;223&gt; Xaa = Any Amino Acid

&lt;400&gt; 13

Met	Ala	Glu	Lys	Ala	Leu	Glu	Ala	Val	Gly	Cys	Gly	Leu	Gly	Pro	Gly
1				5					10					15	
Ala	Val	Ala	Met	Ala	Val	Thr	Leu	Glu	Asp	Gly	Ala	Glu	Pro	Pro	Val
		20						25					30		
Leu	Thr	Thr	His	Leu	Lys	Lys	Val	Glu	Asn	His	Ile	Thr	Glu	Ala	Gln
		35					40					45			
Arg	Phe	Ser	His	Leu	Pro	Lys	Arg	Ser	Ala	Val	Asp	Ile	Glu	Phe	Val
	50					55					60				
Glu	Leu	Ser	Tyr	Ser	Val	Arg	Glu	Gly	Pro	Cys	Trp	Arg	Lys	Arg	Gly
65					70					75					80
Tyr	Lys	Thr	Leu	Leu	Lys	Cys	Leu	Ser	Gly	Lys	Phe	Cys	Arg	Arg	Glu
				85					90					95	
Leu	Ile	Gly	Ile	Met	Gly	Pro	Ser	Gly	Ala	Gly	Lys	Ser	Thr	Phe	Met
			100					105					110		
Asn	Ile	Leu	Ala	Gly	Tyr	Arg	Glu	Ser	Gly	Met	Lys	Gly	Gln	Ile	Leu
		115					120					125			
Val	Asn	Gly	Arg	Pro	Arg	Glu	Leu	Arg	Thr	Phe	Arg	Lys	Met	Ser	Cys
	130					135					140				
Tyr	Ile	Met	Gln	Asp	Asp	Met	Leu	Leu	Pro	His	Leu	Thr	Val	Leu	Glu
145					150					155					160
Ala	Met	Met	Val	Ser	Ala	Asn	Leu	Lys	Leu	Ser	Glu	Lys	Gln	Glu	Val
				165					170					175	
Lys	Lys	Glu	Leu	Val	Thr	Glu	Ile	Leu	Thr	Ala	Leu	Gly	Leu	Met	Ser
			180					185					190		
Cys	Ser	Arg	Thr	Arg	Thr	Ala	Leu	Leu	Ser	Gly	Gly	Gln	Arg	Lys	Arg
		195					200					205			
Leu	Ala	Ile	Ala	Leu	Glu	Leu	Val	Asn	Asn	Pro	Pro	Val	Met	Phe	Phe
	210					215					220				
Asp	Glu	Pro	Thr	Ser	Gly	Leu	Asp	Ser	Ala	Ser	Cys	Phe	Gln	Val	Val
225					230					235					240
Ser	Leu	Met	Lys	Ser	Leu	Ala	Gln	Gly	Gly	Arg	Thr	Ile	Ile	Cys	Thr
			245						250					255	
Ile	His	Gln	Pro	Ser	Ala	Lys	Leu	Phe	Glu	Met	Phe	Asp	Lys	Leu	Tyr
			260					265					270		
Ile	Leu	Ser	Gln	Gly	Gln	Cys	Ile	Phe	Lys	Gly	Val	Val	Thr	Asn	Leu
		275					280					285			
Ile	Pro	Tyr	Leu	Lys	Gly	Leu	Gly	Leu	His	Cys	Pro	Thr	Tyr	His	Asn
	290					295					300				
Pro	Ala	Asp	Phe	Ile	Ile	Glu	Val	Ala	Ser	Gly	Glu	Tyr	Gly	Asp	Leu
305					310					315					320
Asn	Pro	Met	Leu	Phe	Arg	Ala	Val	Gln	Asn	Gly	Leu	Cys	Ala	Met	Ala
			325						330					335	
Glu	Lys	Lys	Ser	Ser	Pro	Glu	Lys	Asn	Glu	Val	Pro	Ala	Pro	Cys	Pro
			340					345					350		
Pro	Cys	Pro	Pro	Glu	Val	Asp	Pro	Ile	Glu	Ser	His	Thr	Phe	Ala	Thr
		355					360					365			
Ser	Thr	Leu	Thr	Gln	Phe	Cys	Ile	Leu	Phe	Lys	Arg	Thr	Phe	Leu	Ser

370		375		380
Ile Leu Arg Asp Thr Val	Leu Thr His Leu Arg Phe Met Ser His Val			
385	390	395		400
Val Ile Gly Val Leu Ile Gly Leu Leu Tyr Leu His Ile Gly Asp Asp				
	405	410		415
Ala Ser Lys Val Phe Asn Asn Thr Gly Cys Leu Phe Phe Ser Met Leu				
	420	425		430
Phe Leu Met Phe Ala Ala Leu Met Pro Thr Val Leu Thr Phe Pro Leu				
	435	440		445
Glu Met Ala Val Phe Met Arg Glu His Leu Asn Tyr Trp Tyr Ser Leu				
	450	455		460
Lys Ala Tyr Tyr Leu Ala Lys Thr Met Ala Asp Val Pro Phe Gln Val				
465	470	475		480
Val Cys Pro Val Val Tyr Cys Ser Ile Val Tyr Trp Met Thr Gly Gln				
	485	490		495
Pro Ala Glu Thr Ser Arg Phe Leu Leu Phe Ser Ala Leu Ala Thr Ala				
	500	505		510
Thr Ala Leu Val Ala Gln Ser Leu Gly Leu Leu Ile Gly Ala Ala Ser				
	515	520		525
Asn Ser Leu Gln Val Ala Thr Phe Val Gly Pro Val Thr Ala Ile Pro				
	530	535		540
Val Leu Leu Phe Ser Gly Phe Phe Val Ser Phe Lys Thr Ile Pro Thr				
545	550	555		560
Tyr Leu Gln Trp Ser Ser Tyr Leu Ser Tyr Val Arg Tyr Gly Phe Glu				
	565	570		575
Gly Val Xaa Leu Thr Ile Tyr Gly Met Glu Arg Gly Asp Leu Thr Cys				
	580	585		590
Leu Glu Glu Arg Cys Xaa Phe Arg Glu Pro Gln Ser Ile Leu Arg Ala				
	595	600		605
Leu Asp Val Glu Asp Ala Lys Leu Tyr Met Asp Phe Leu Val Leu Gly				
	610	615		620
Ile Phe Phe Leu Ala Leu Arg Leu Leu Ala Tyr Leu Val Leu Arg Tyr				
625	630	635		640
Arg Val Lys Ser Glu Arg				
	645			

<210> 14  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Oligonucleotide used in RT-PCR reaction.

<400> 14  
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27

<210> 15  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence

<220>



<223> Oligonucleotide used in RT-PCR reaction.

<400> 15  
cccacaaata caactggcat ccctg 25

<210> 16  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Oligonucleotide used in RT-PCR reaction.

<400> 16  
taccgagctc ggatccacta gtcc 24

<210> 17  
<211> 23  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Oligonucleotide used in RT-PCR reaction.

<400> 17  
caggccctgc cccacacaaa ggt 23

<210> 18  
<211> 23  
<212> PRT  
<213> Homo sapiens

<400> 18  
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1 5 10 15  
Thr Val Leu Thr Phe Pro Leu  
20

<210> 19  
<211> 23  
<212> PRT  
<213> Homo sapiens

<400> 19  
Tyr Leu Ala Lys Thr Met Ala Asp Val Pro Phe Gln Val Val Cys Pro  
1 5 10 15  
Val Val Tyr Cys Ser Ile Val  
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<210> 20  
<211> 23

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<212> PRT
<213> Homo sapiens
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<400> 20
Phe Leu Leu Phe Ser Ala Leu Ala Thr Ala Thr Ala Leu Val Ala Gln
 1             5             10            15
Ser Leu Gly Leu Leu Ile Gly
      20
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<210> 21
<211> 21
<212> PRT
<213> Homo sapiens
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```
<400> 21
Thr Phe Val Gly Pro Val Thr Ala Ile Pro Val Leu Leu Phe Ser Gly
 1             5             10             15
Phe Phe Val Ser Phe
      20
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<210> 22
<211> 18
<212> PRT
<213> Homo sapien
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```
<400> 22
Leu Ser Tyr Val Arg Tyr Gly Phe Glu Gly Val Ile Leu Thr Ile Tyr
 1             5             10             15
Gly Met
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```
<210> 23
<211> 23
<212> PRT
<213> Homo sapiens
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```
<400> 23
Leu Tyr Met Asp Phe Leu Val Leu Gly Ile Phe Phe Leu Ala Leu Arg
 1             5             10             15
Leu Leu Ala Tyr Leu Val Leu
      20
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